Two New Species of *Pseudomugil* (Pisces: Melanotaeniidae) from Irian Jaya and New Guinea

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ABSTRACT

Two new species of *Pseudomugil, P. helodes* from Misool and Batanta Islands, Irian Jaya and *P. majusculus* from North New Guinea, are described on the basis of specimens obtained by the Alpha Helix Expedition in 1979. *Pseudomugil helodes* appears to have no close relatives, but belongs to a species complex which includes *P. signifer, P. gertrudae* and *P. tenellus. Pseudomugil majusculus* is also a member of this group and is most closely related to *P. signifer* of eastern Australia. A key to the genus *Pseudomugil* is included.

INTRODUCTION

Munro (1958, 1967) listed four species of *Pseudomugil* from Australia and five species from New Guinea. *P. gertrudae* was included in both lists on the basis of its distribution on both sides of Torres Strait. Further collecting in recent years has resulted in description of four additional species (Taylor 1964, Roberts 1978, Allen and Moore 1981, Allen and Ivantsoff 1982). Comprehensive studies of Melanotaeniidae by Allen (1980) and Allen and Cross (1982) had shown that *P. furcatus* Nichols from northern New Guinea merits generic distinction. In addition, *P. signatus* (Günther) was recognised as a junior synonym of *P. signifer* by Hadfield *et al.* (1979). The species recognised by the present authors include: *P. gertrudae* Weber (New Guinea and Australia), *P. inconspicuus* Roberts (New Guinea), *P. mellis* Allen and Ivantsoff (Australia), *P. novaeguineae* Weber (New Guinea), *P. paludicola* Allen and Moore (New Guinea), *P. signifer* Kner (Australia) and *P. tenellus* Taylor (Australia). Two additional species, *P. helodes* from Irian Jaya and *P. majusculus* from New Guinea are described herein. These new species were collected during the 1979 "Alpha Helix" Expedition to Indonesia and New Guinea by Dr Bruce B. Collette.

MATERIALS AND METHODS

The methods for counts and measurements are mainly based on Munro (1967) with the exception of the following: the interdorsal scale count was taken from the origin of the last spine of the first dorsal fin along the mid-dorsal line to the origin of the

first element of the second dorsal fin. The predorsal scale count included all the scales along the mid-dorsal line from the head to the origin of the first dorsal. The transverse scale count was taken by counting rows of scales diagonally downwards and forwards from the origin of the first dorsal fin to and including the midlateral scale row, plus the scales counted diagonally upwards and backwards to the lower edge of the midlateral row, from the origin of the ventral fins. The midlateral scale count was taken as the number of scales between the upper pectoral fin base and the hypural joint. The position of the origin of the first dorsal fin was recorded as a number of scales in front of a vertical through the pelvic fin tips and also as the number of scales behind a vertical through the pectoral fin tips. The position of the origin of the ventral fins was recorded as a number of scales in front of or behind a vertical through the pectoral fin tips. The position of the second dorsal fin was recorded as a number of scales behind a vertical through the origin of the anal fin. All measurements were made to the nearest 0.1 mm with dial calipers. Standard length is abbreviated as SL. Measurements and counts were recorded for 30 type specimens of *P. helodes*. *Pseudomugil majusculus* is described from the holotype which is the only known specimen. Line drawings of the mouth parts of *P. signifer, P. helodes* and *P. majusculus* were made from prepared alizarins (with the exception of the last species) using camera lucida.

Specimens of *P. helodes* are deposited at the United States National Museum of Natural History (USNM), The Australian Museum Sydney (AMS) and Western Australian Museum, Perth (WAM). The holotype of *P. majusculus* is deposited at USNM. The following specimens were studied for comparative purposes:

P. inconspicuus, 25 specimens (USNM 217162, holotype and USNM 21763, paratypes.

P. novaeguineae, ZMA 103.197 (Zoological Museum of the University of Amsterdam, specimen labelled lectotype); ZMA 110.175 (2 specimens labelled paralectotypes); ZMA 103.198, 6 specimens.*

P. paludicola, 10 specimens (AMS I.21302-001, paratypes).

P. gertrudae, ZMA 103.196 (5 specimens labelled paralectotypes); SMF 10013 (Senckenberg Museum, Frankfurt, 4 of 12 specimens, all labelled paratypes).*

P. signifer, MU I.081 (Macquarie University Sydney), 5 specimens; MU I.143, 5 specimens; 422 specimens (see Hadfield *et al.,* 1979).

P. tenellus, 13 specimens (USNM 174252, paratypes).

* The validity of the status of some of the type specimens appears to be doubtful and will require an investigation.

KEY TO SPECIES OF *PSEUDOMUGIL*

Allen and Cross (1982) presented a key and diagnoses for the known species of *Pseudomugil*. The acquisition of additional material and descriptions of *P. mellis* by Allen and Ivantsoff (1982) and the two species described herein is justification for a revised key which appears below.

1a. First dorsal origin at or behind vertical through origin of ventrals; predorsal scale count rarely as low as 13 and usually more than 15 2

1b. First dorsal origin in front of vertical through tips of ventrals; predorsal scale count rarely as high as 14 and usually less than 13 4

2a. First dorsal origin in front of vertical through origin of anal; mouth gape wide and completely unrestricted ..... *P. novaeguineae*

2b. First dorsal origin behind vertical through origin of anal; mouth gape small and restricted by ligament 3

3a. No conspicuous lateral process on premaxillary bone; anal fin ray count 10-14; least depth in SL 6.7-8.0 ..... *P. paludicola*

3b. Pungent lateral process on premaxillary; anal fin ray count 9-11; least depth in SL 9.2-11.0 ..... *P. inconspicuus*

4a. Unpaired fins with round or oval spots on median fins; pectoral fins with orange tinge in live males, clear in females ..... *P. gertrudae*

4b. Unpaired fins coloured or clear but never with oval spots; pectoral fins clear irrespective of sex 5

5a. Gill raker count in first lower gill arch 12 or less 6

5b. Gill raker count in first lower gill arch 14 or greater 7

6a. Unpaired fins usually whitish in outline in males but clear in females when live; transverse scale count 7-9; anal fin ray count 6-8 ..... *P. tenellus*

6b. Unpaired fins with black, yellow or orange markings in males and translucent in females; transverse scale count 5-6; anal fin ray count 9-12 8

7a. Gill rakers in first lower gill arch 16-18; midlateral scales 28-30; body scales distinctly crenulated ..... *P. helodes*

7b. Gill rakers in first lower gill arch 14; midlateral scales 26; scales not crenulated ..... *P. majusculus*

8a. Pores small on head and absent on lower jaw; teeth in upper jaw small and not visible when mouth closed. Interorbital width in head 2.4-3.2, usually nearer 3.2 ..... *P. mellis*

8b Pores large on head and present on lower jaw; teeth in upper jaw large and distinctly visible when mouth closed. Interorbital width in head 1.9-2.5, usually nearer 2.3 ..... *P. signifer*

PSEUDOMUGIL HELODES, NEW SPECIES

Pseudomugil species "A" Allen and Cross, 1982: 130.

Holotype — USNM 236543, 27 mm, rotenone in 1 m of water, in mangrove swamp, Misool Island, Irian Jaya, Indonesia, 02° 3.1′S 130° 6.4′E, 3 July, 1979, collected by Bruce B. Collette "Alpha Helix" Expedition, 1979.

Paratypes — 31 specimens: USNM 236545, 21 specimens, 19.7-25.7 mm SL, data as for holotype; USNM 236544, 7 specimens, 17.9-29.6 mm SL, rotenone in 1m of water, in mangrove swamp, Batanta Island, Marchesa Bay, North West Irian Jaya, Indonesia, 0°48.2′S 130° 52.8′E, 2 July, 1979, collected by Bruce B. Collette, "Alpha Helix" Expedition, 1979. AMS I.24364-001, 2 cleared and stained specimens, 20.0-25.6 mm SL, data as for holotype.

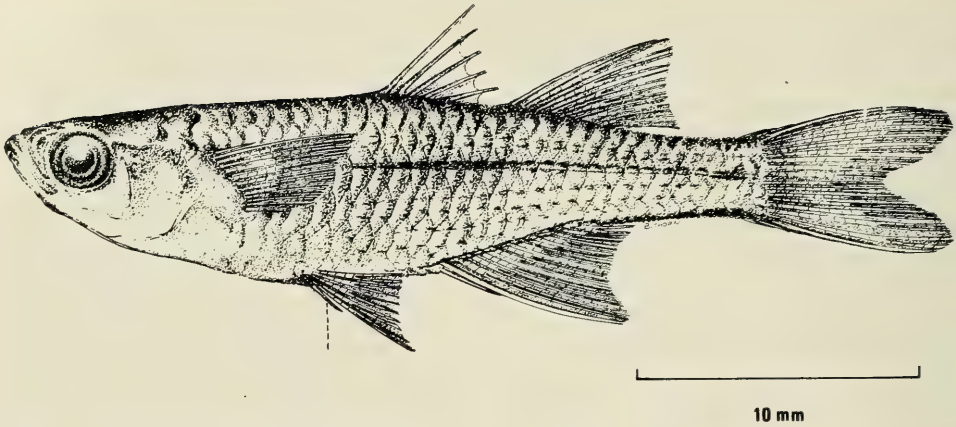

Fig. 1. *Pseudomugil helodes,* line drawing of the holotype USNM 236543, 27 mm SL.

Other specimens — AMS I.22838-001, 5 specimens, 17.9-20.0 mm SL, data as for holotype; WAM P27972-001, 5 specimens, 17.7-21.6 mm SL, data as for holotype; USNM 236546, 12 specimens, 11.6-19.7 mm SL, data as for holotype.

The description of the new species is based on the holotype and paratypes.

General Description

Meristics and Morphometrics

All of the measurements and counts taken are presented in Table 1.

Fig. 2. a. Premaxillary bone of the holotype of *Pseudomugil majusculus* USNM 236542, 3.2 mm SL.
b. Maxilla, premaxilla and dentary of *Pseudomugil signifer,* an unregistered alizarin specimen, Smith Lake, N.S.W. Australia, 32°23′S 152°28′E, 27 mm SL.
c. Maxilla, premaxilla and dentary of *Pseudomugil helodes,* USNM 236545, 26.8 mm SL.

TABLE 1. Measurements and counts of 30 specimens of *Pseudomugil helodes*. Abbreviations: SL, standard length; Pec L, length of longest pectoral ray; H max, greatest body depth; H min, least body depth; Width max, greatest body width; Sn, snout; OD_1, origin of the first dorsal fin; OD_2, origin of the second dorsal fin; OV, origin of ventral fins; TV, tips of ventral fins; OA, origin of anal fin; TA, last ray insertion of anal fin. Position of the fins and anus is expressed as a number of scales in front of (F) or behind (B) the point of reference.

	Holotype		Mean, range and standard deviation for holotype and 29 paratypes*	
	27.0 mm SL		17.9-29.6 mm SL	
In SL				
Head	3.2		3.3 (3.2-3.5)	.08
Pec L	4.3	(23)	4.6 (4.3-5.0)	.16
H max	3.8		4.2 (3.8-4.5)	.19
H min	9.5		9.6 (8.8-10.8)	.42
Width max	6.2		6.4 (6.1-6.7)	.17
Sn-OD_1	1.8		1.8 (1.7-1.9)	.06
Sn-OD_2	1.4		1.4 (1.4-1.5)	.02
Sn-OV	2.1		2.2 (2.0-2.2)	.06
Sn-TV	1.5		1.7 (1.5-1.7)	.06
Sn-OA	1.6		1.6 (1.5-1.6)	.03
Sn-TA	1.2		1.2 (1.2-1.3)	.03
In head				
Eye	2.8		2.7 (2.5-2.9)	.11
Interorbital	2.5		2.6 (2.4-2.9)	.11
Postorbital	2.5		2.6 (2.3-2.8)	.14
Caudal peduncle length	1.8		1.7 (1.5-1.9)	.13
In eye				
Snout	1.8	(29)	1.7 (1.5-2.0)	.16
Premaxilla	1.4		1.5 (1.3-1.8)	.15
Premaxillary process	4.1	(29)	4.3 (3.2-5.6)	.63
Scale counts				
Midlateral scales	29		29 (28-30)	.61
Transverse scales	6		5.4 (5-6)	.24
Pedorsal scales	11		12.1 (11-13)	.43
Interdorsal scales	5		4.1 (4-5)	.5
Cleithrum-OV	5	(21)	6.7 (5-7)	.62
Fin elements				
First dorsal spines	5	(29)	4.8 (3-5)	.51
Second dorsal rays	7		7.0 (6-8)	.49
Anal rays	11	(29)	11.5 (11-13)	.63
Pectoral rays	11	(28)	10.7 (10-11)	.46
Position of fins				
OD_1 to TV	F2		F2.1 (F1-3)	.63
OD_1 to T Pec	–	(25)	B2.0 (B1-3)	.62
OD_2 to Anal	B4		B3.1 (B2-4)	.64
OV to T Pec	–	(24)	F2.7 (F2-4)	.57
Other values				
Gill rakers in first lower gill arch	16		16.8 (16-18)	.65
Position of anus to TV	F5		F3.5 (F3-5)	.62
Vertebrae	30		30.2 (29-31)	.58

*Unless otherwise indicated. Numbers in bracket preceding mean, indicates the number of specimens counted or measured (some specimens are damaged).

External morphology

Relatively small, laterally compressed species, known specimens not exceeding 30 mm SL. Mouth small but unrestricted by labial ligament. Premaxilla with strongly curved, villiform teeth on its free border, extending almost as far as its distal end. Ramus of premaxilla broad with short median process and small rounded lateral process (Fig. 2c). Free edge of premaxilla with distinct concavity in anterior half with dentary recessing into it. Maxilla slender. Posterior ramus of lower jaw highly elevated. Teeth on dentary smaller than on premaxilla, curved, villiform and restricted to first third or half or lower jaw. Both jaws oblique to horizontal and not extending as far as vertical through anterior border of eye. Teeth present on palatines, ectopterygoids, vomer and basihyal in some specimens. Pelvic girdle attached to rib of 6th vertebra. Principal caudal rays always 8+7. Sexual dimorphism not apparent. Lateral body scales moderately large, cycloid, crenulate, dorsoventrally elongated, with circuli prominent on anterior half of scale only. 3 to 4 scales on preopercle and one large and several smaller scales on opercle. Large circular scale over interorbital space followed by larger semicircular scale and rest of predorsal series. Ventral axillary scale large and distinct. Unpaired fins short when compared with other species of *Pseudomugil*. First dorsal not reaching origin of second dorsal. Third ray longest in second dorsal fin. Ventrals not reaching origin of anal. Anal fin spine always present. Pectoral fins pointed. Caudal moderately forked. Gill rakers numerous, moderately long and slender but less than half diameter of pupil.

Colour

Preserved specimens yellow green. Eye black. Dorsum of head dark, with concentration of melanophores on snout and postorbital part of head. Rim of lower half of eye outlined by melanophores. Side of snout, chin and opercle heavily peppered with small and large melanophores. Narrow but well defined black middorsal band originating on dorsum of head and extending through bases of dorsal fins to origin of caudal. Scale pockets on side of body well outlined by melanophores. Some melanophores also scattered within perimeter of each scale pocket with greatest concentrations of these in pockets of midlateral scale row. Midlateral band narrow dark line at its origin at dorsal base of pectoral, and continuing as two narrow lines from above origin of anal to caudal fin. Concentrations of melanophores on each scale along side of body forming faint discontinuous streaks, about four in number, excluding midlateral stripe. Bases of fins outlined by pigment; dark thin line through middle of scales directly above base of anal. Extremities of second dorsal and anal fins peppered with fine melanophores. Spines of first dorsal and rays of pectoral outlined by pigmentation. Body apparently translucent in life and with posterior end of swimbladder clearly visible even in preserved specimens, terminating ventrally at origin of anal and dorsally below vertebral column about 2 scales behind vertical through origin of anal.

Etymology

Helodes (Greek), meaning marshy. Like several other species of *Pseudomugil*, the new species occurs in mangrove swamps or in marshy habitat.

TABLE 2. Diagnostic attributes of 8 species of *Pseudomugil*. Ranges incorporate data from literature as indicated. The means were obtained from the specimens examined in this study except for *P. signifer*. Abbreviations: as in Table 1.

	P. inconspicuus	*P. novaeguineae*	*P. paludicola*	*P. gertrudae*	*P. helodes*	*P. majusculus*	*P. signifer*	*P. tenellus*
In SL								
Head	3.8(3.6-4.2)	4.3(4.0-4.5)*	3.7(3.5-4.2)*	3.5(3.3-3.9)*	3.3(3.2-3.5)	3.8	3.8(3.4-4.3)*	3.4(3.3-3.6)
H min	10.0(9.2-11.0)	11.1(9.6-12.3)	7.4(6.7-8.0)	7.9(7.5-8.1)	9.6(8.8-10.8)	10.1	9.4(8.3-11.6)	9.1(8.5-9.6)
In Head								
Interorbital	2.8(2.5-3.0)	2.6(2.4-2.7)	2.2(1.9-2.5)*	2.1(2.0-2.3)	2.6(2.4-2.9)	2.1	2.3(1.9-2.5)	2.7(2.5-2.8)
Postorbital	2.6(2.3-3.0)	2.7(2.4-2.9)	2.4(2.2-2.5)	2.2(2.0-2.4)	2.6(2.3-2.8)	2.7	2.6(2.3-2.8)	2.4(2.3-2.9)
In eye								
Premaxillary process	2.0(1.8-2.4)	2.6(2.2-3.4)	3.1(2.5-3.6)	2.7(2.4-3.4)	4.3(3.2-5.6)	2.7	2.9(2.3-3.6)	3.8(3.2-5.1)
Scale counts								
Transverse	5.0(5-6)	6-7*	5	6.4(6-7)	5.4(5-6)	5	5.7(5-6)	7.9(7-9)
Predorsal	16(14-17)	17(14-18)*	15.3(13-16)	12.4(10-13)*	12.1(11-13)	12	11.5(10-12)	12.0(11-14)
Fin elements								
Anal rays	10.0(9-11)	10.4(9-12)	11.4(10-14)*	9.2(8-10)	11.5(11-13)	12	10.4(9-12)*	7.1(6-9)
Pectoral rays	10.2(10-12)*	10.8(10-13)*	10.5(10-13)*	8.8(7-11)*	10.7(10-11)	10	9.3(8-13)*	10.0(9-11)
Position of fins								
OD_1 to TV	B2.5(1-3.5)	B2.6(2-3)	B2.8(2-4)	F5.3(2.5-2.8)	F2.1(1-3)	F3	F3.7(2.5-5)	F2.5(1-4)
OD_1 to T Pec	B4.9(3-6.5)	B6	B5.4(4-7)	B1.6(B3-F2)	B2(1-3)	B3	B0.9(0-3)	B2.2(1-4)
Other values and Attributes								
Gill rakers in first lower gill arch	11.3(10-12)	8.3(8-9)	8.6(8-10)	10(9-11)	16.8(16-18)	14	10.3(9-12)	9(8-10)
Vertebrae	29.8(29-31)	33(31-35)	27.8(27-30)*	28.9(28-30)	30.2(29-31)	28	28.6(27-29)	27.8(26-28)
Spine in anal fin	present	present	present	present	present	?	absent	absent
	*range incorporates Roberts' (1978) count	*ranges incorporate Roberts' (1978) and Munro's (1967) data	*ranges incorporate Allen and Moore's (1978) data	*ranges incorporate Roberts' (1978) and Munro's (1967) data			*means and ranges based on Hadfield's *et al.* raw data (1979)	

Relationship To Other Species Of *Pseudomugil*

It appears that the genus *Pseudomugil* is composed of two distinct groups:

1. *P. inconspicuus, P. novaeguineae* and *P. paludicola* have high predorsal scale counts (Table 2). The first dorsal fin originates far back along the body, slightly in front of vertical through the origin of anal in *P. novaeguineae* and behind that vertical in the other two species.
2. *P. tenellus, P. gertrudae, P. signifer* and *P. helodes* all have their dorsal fins in a more anterior position as had already been noted by Allen and Moore (1981) for the first three.

P. helodes can be readily distinguished from the other members of the second group: from *P. gertrudae* it is distinguished by the coloration, the anal ray fin count and the more slender caudal peduncle in *P. gertrudae*. From *P. tenellus* it can distinguished by the vertebral, gill raker, anal fin ray and the transverse scale row counts. *P. helodes* is most closely related to *P. signifer* but is easily distinguished from the latter by its high gill raker count, the crenulation of the body scales as well as by the presence of a spine in the anal fin in *P. helodes* but not in *P. signifer*. Although a number of meristics as well as morphometric measurements of the two species overlap, their means are distinct and different for the prectoral fin count, position of first dorsal fin, length of premaxillary process, width of interorbital space and length of head.

Distribution

The present known distribution of *P. helodes* is restricted to islands just north west and west of New Guinea. This is the westernmost known extreme of the range for the species of the family Melanotaeniidae. The species appears to inhabit mangrove swamps. Since other species of *Pseudomugil* (e.g. *P. signifer*) are known to inhabit a variety of habitats, from freshwater streams to bays and estuaries with high salinities, it is not unlikely that *P. helodes* may also be found in other habitats.

PSEUDOMUGIL MAJUSCULUS, NEW SPECIES

Pseudomugil species "B" Allen and Cross, 1982: 130.

Holotype — USNM 236542, 31.9 mm SL, rotenone in 1 m of water, in mangroves, Cape Ward Hunt, Papua New Guinea, 08° 04.2′N 148° 08.4′E, 17 June, 1979, collected by Bruce B. Collette, "Alpha Helix" Expedition, 1979. The description is based on the holotype, the only known specimen of the new species.

General Description

Meristics and Morphometrics

All of the measurements and counts taken are presented in Table 3.

External morphology

One of larger species of *Pseudomugil* (others usually less than 30 mm SL) with moderately compressed body. Mouth small but unrestricted by labial ligament.

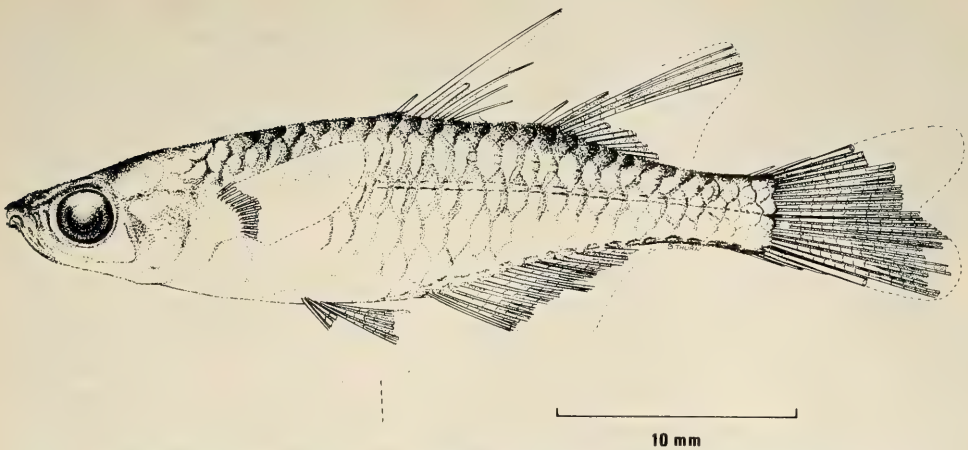

Fig. 3. *Pseudomugil majusculus,* line drawing of the holotype USNM 236542, 31.9 mm SL.

TABLE 3. Measurements and counts made on the holotype of *Pseudomugil majusculus.* Abbreviations: as in Table 1.

SL	31.9	Scale counts	
In SL		Midlateral scales	26
Head	3.8	Transverse scales	5
H max	4.1	Predorsal scales	12
H min	10.1	Interdorsal scales	4
Width max	6.6		
Sn-OD_1	1.9	Fin elements	
Sn-OD_2	1.4	First dorsal spines	5
Sn-OV	2.3	Second dorsal rays	7
Sn-TV	1.7	Anal rays	12
Sn-OA	1.7	Pectoral	damaged, about 10
Sn-TA	1.3		
In head			
Eye	2.7	Position of fins	
Interorbital	2.1	OD_1 to TV	F3
Postorbital	2.7	OD_2 to Anal	B3
Caudal peduncle length	1.3		
In Eye		Other values	
Snout	1.7	Gill rakers in first lower gill arch	14
Premaxilla	1.4	Position of anus to TV	F3
Premaxillary process	2.7	Vertebrae	28

Premaxilla broad with short median process and with no lateral process (Fig. 2a), with its free border notched anteriorly. Teeth on free border of premaxilla in several rows near symphysis and with another two teeth midway along its free edge (Fig. 2a). Dentary with strong villiform teeth pointing backwards and extending at least half way along dentary. Posterior of dentary elevated. Teeth

not apparent on other bones except for mesopterygoids. Pelvic girdle attached to rib of 6th vertebra. Principal caudal rays 8+7. Holotype probably male (not dissected) since second spine of first dorsal extended into filament as in males of *P. signifer.* Second and third rays of second dorsal also long. Body scales large, cycloid, dorsoventrally elongated, with indistinct circuli restricted to anterior half of scale. Posterior edge of scale entire. Gill rakers short, less than half diameter of pupil but not tubercular in shape.

Colour

Preserved specimen yellow green. Eye black. Dorsum of head dark with concentration of melanophores on top of snout and preorbital part of head. Melanophores fine and less numerous on side of snout, chin, preopercle and opercle. Discontinuous middorsal band originating on dorsum of head, extending through dorsal fins and terminating at origin of caudal. Scale pockets outlined by very fine melanophores with some melanophores also scattered within perimeter of each scale pocket. Midlateral band restricted to narrow line originating from about 6th scale behind dorsal origin of pectoral to about hypural joint. Faint, discontinuous streaky line directly above midlateral line and two other less prominent lines above it. Bases of fins slightly darker than surrounding areas. Elements of dorsal fins pigmented; those of anal to lesser degree. Edges of rays in caudal pigmented. Body probably translucent in life.

Etymology

Majusculus (Latin), meaning somewhat larger or greater, thus implying that this species grows to a larger size than other species of *Pseudomugil.*

Remarks

Although the holotype of *P. majusculus* is in relatively good condition, all of its fins are damaged to a greater or lesser degree. There are good indications that in life, the dorsal and the ventral fins were extended into filaments and the former were strongly pigmented. It is difficult to assess whether the first element of the second dorsal and anal fins are spines or unbranched rays. The scales in this species are quite deciduous and are absent from some parts of the head and the anterior lower half of the body. For this reason the cheek scales and those between the cleithrum and the origin of ventrals were not counted.

Relationship To Other Species Of *Pseudomugil*

Pseudomugil majusculus can be distinguished from *P. inconspicuus, P. novae-guineae* and *P. paludicola* by a low predorsal scale count and the more anterior position of the origin of the first dorsal fin; from *P. gertrudae,* by the coloration of the latter and the anal fin ray count; from *P. tenellus,* by the gill raker, anal fin ray and transverse scale row counts; from *P. belodes,* by the gill raker count and the absence of crenulation of scales in *P. majusculus;* and from *P. signifer,* by the gill raker count and the gill raker length.

In the genus *Pseudomugil,* the shape of the premaxillary bone appears to be diagnostic at the specific level (see Roberts, 1978 and Fig. 2). However, the shape of the premaxillaries of *P. majusculus* and *P. signifer* is very much alike and of no diagnostic value. On the other hand, the length of the gill rakers and their greater number in *P. majusculus* are regarded as specialised characters. None of the large sample of *P. signifer,* taken from its entire range, from fresh, estuarine and saline waters and examined by Hadfield et al. (1979) had moderately elongate and slender gill rakers or with their number exceeding 12 in the first lower gill arch.

On the basis of the characters examined (Table 2), *P. majusculus* appears to be closest to *P. signifer* but is distinct from it as discussed above.

Distribution

So far, only one specimen has been collected from the northern coast of New Guinea, near Cape Ward Hunt. It appears likely that the species may be restricted to a small geographic area since there have been numerous collections made both on the north and the south coast of New Guinea in recent years.

ACKNOWLEDGEMENTS

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